B. AMENDMENTS TO THE CLAIMS

This listing of claims will replace all prior versions, and listings, of claims in the application.

Listing of Claims:

1. (original) A method of stabilizing the calculation of CT (computed tomography) numbers by a CT system, the CT system including an x-ray source for generating x-rays in response to a voltage supplied by a voltage source, the method comprising:

a) calculating the CT number of a sample having a known CT number value;

b) adjusting the voltage supplied by the voltage source to a reference level for which the calculation in step (a) yields said known CT number value; and

c) measuring the energy spectrum of the x-rays generated by the x-ray source;

d) adaptively regulating the voltage based on the spectrum measured in step (c), so as to prevent any deviation in the voltage from said reference level determined in step (b); and

e) maintaining the voltage substantially constant at said reference level by repeating steps (c) and (d) during subsequent CT number measurements by said CT system.

2. (original) A method according to claim 1,

A. wherein measuring the energy spectrum of the x-rays in step (c) comprises :

i) using a principal detector to detect x-rays emitted by said x-ray source so as to generate a first intensity magnitude;

ii) using an auxiliary detector to detect x-rays emitted by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy;

and

B. wherein regulating the voltage in step (d) comprises:

(i) generating a control signal proportional to a known function of said first and second intensity magnitudes; and

(ii) adjusting said voltage based on said control signal.

3. (original) A method according to claim 2, wherein said absorber is made of a material adapted to optimize the sensitivity of said known function to fluctuations in said voltage from said reference level.

4. (original) A method according to claim 3, wherein said absorber is selected from the group consisting of copper, molybdenum, and tungsten.

5. (original) A method according to claim 2, wherein said known function of said first and second intensity magnitudes comprises a ratio of the first and second intensity magnitudes.

6. (original) A method according to claim 1, wherein regulating the voltage in step (d) comprises providing to the voltage source a voltage control signal proportional to the deviation in voltage from said reference level.

7. (original) A method according to claim 1, wherein the variation in the values of CT numbers measured by said CT system is reduced to less than about 0.1%.

8. (original) A method according to claim 1,
wherein the deviation of said voltage from said reference level is maintained to less than about 0.03 %.

9. (original) A method according to claim 1, further comprising:
i) recording, after step (b), the measured x-ray energy value resulting from the adjustment of said voltage in step (b); and
ii) in step (d), regulating the voltage so that the measurement of the x-ray energy in step (c) yields the value recorded in step (i).

10. (original) A method according to claim 1, wherein said sample having a known CT number value comprises water.

11. (original) A method of stabilizing the measurement of CT numbers by a CT system, the CT system including an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the method comprising:

a) establishing a reference level for said voltage by adjusting the voltage to a value for which calculation by said CT system of the CT number of a sample having a known CT number value yields said known CT number value;

b) using a principal detector to detect x-rays generated by said x-ray source so as to generate a first intensity magnitude;

c) using an auxiliary detector to detect x-rays generated by said x-ray source so as to generate a second intensity magnitude, wherein said auxiliary detector includes an absorber that preferentially absorbs x-ray photons having a relatively low energy;

d) generating a voltage control signal, and providing said voltage control signal to said voltage source, so as to maintain said voltage substantially constant at said reference level, thereby substantially reducing in said CT system a variation in the calculated values of CT numbers;

wherein said voltage control signal is proportional to a known function of said first and second intensity magnitudes.

12. (original) A CT system, comprising:

a) an x-ray source for generating x-rays in response to a voltage provided by a voltage source;

b) a detection system for detecting x-rays generated by said x-ray source and transmitted through a target object;

c) a kV meter for measuring an energy spectrum of x-rays generated by said x-ray source;

d) a processor for calculating the CT numbers of said target object; and

(e) a feedback controller for providing to the voltage source a voltage control signal;

wherein the energy spectrum measured by said kV meter is used to adjust said voltage control signal so as to maintain said voltage substantially constant at a reference level established during calibration, and

wherein said reference level is the voltage level at which calculation by said CT system of the CT

number of a sample having a known CT number value yields the correct known CT number value.

13. (original) A CT system according to claim 12,
wherein said kV meter includes a principal detector for detecting x-rays generated by said x-ray source so as to generate a first intensity magnitude, and an auxiliary detector for detecting x-rays generated by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy; and
wherein said voltage control signal is proportional to a known function of said first and second intensity magnitudes.

14. (currently amended) A CT system according to claim 13~~12~~, wherein said known function of said first and second intensity magnitudes comprises a ratio of said first and second intensity magnitudes.

15. (currently amended) A CT system according to claim 13~~12~~, wherein at least one of said principal detector and said auxiliary detector comprises a semiconductor detector.

16. (original) A CT system according to claim 12, wherein said detector system includes an array of detectors.

17. (original) A CT system for performing stabilized CT number measurements, said CT system comprising:
a) an x-ray source for generating x-rays in response to a voltage provided by a voltage source;
b) a detection system for detecting x-rays emitted by said x-ray source and transmitted through a target object;
c) a kV meter, comprising:
i) a principal detector for detecting x-rays generated by said x-ray source so as to generate a

first intensity magnitude;

ii) an auxiliary detector for detecting x-rays generated by said x-ray source so as to generate a second intensity magnitude, said auxiliary detector including an absorber that preferentially absorbs x-ray photons having a relatively low energy;

d) a processor for calculating CT numbers of said target object so as to reconstruct a CT image of said target object;

and

e) a feedback controller for providing to the voltage source a voltage control signal;

wherein said voltage control signal is adjusted as a function of a ratio of said first and second intensity magnitudes so as to maintain said voltage substantially constant at a reference level established during calibration, thereby substantially reducing in said CT system a variation in the measured values of CT numbers; and

wherein said reference level is the magnitude of the voltage at which calculation by said CT system of a sample having a known CT number value yields the correct known CT number value.

18. (currently amended) An apparatus for stabilizing CT number calculations by a CT system having an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the apparatus comprising:

a) a kV meter for measuring a spectrum of x-rays generated by said x-ray source so that the voltage provided by the voltage source can be adjusted to a reference level at which the CT number of a ~~said~~ sample as measured by said CT system is substantially equal to a ~~said~~ known CT number value; and

b) a feedback controller for providing to the voltage source a voltage control signal based on said measured x-ray spectrum so that the voltage can be adjusted in response to said control signal so as to maintain the voltage constant at said reference level, thereby substantially reducing a variation in the calculated values of the CT numbers of a target object, as determined by said CT system.

19. (original) An apparatus for stabilizing CT number calculations in a CT system having an x-ray source for generating x-rays in response to a voltage provided by a voltage source, the apparatus comprising:

a) a principal detector for detecting x-rays generated by said x-ray source so as to generate a first intensity magnitude;

b) an auxiliary detector having an absorber that preferentially absorbs x-rays photons having a relatively low energy, the auxiliary detector being adapted to detect x-rays generated by said x-ray source so as to generate a second intensity magnitude; and

c) a feedback controller for providing to the voltage source a voltage control signal;

wherein said voltage control signal is adaptively adjusted, based on a predetermined function of said first intensity magnitude and said second intensity magnitude, so as to maintain the voltage provided to the x-ray source constant at a reference level for which the calculation by said CT system of the CT number of a sample having a known CT number value yields the correct known CT number value.

20. (original) An apparatus according to claim 19, wherein said predetermined function is a ratio between said first intensity magnitude and said second intensity magnitude.